

WHAT IS CLAIMED IS:

1. A device for toning or tightening a sphincter within a body, the device comprising:
 - an insertion device having a proximal end and a distal end, wherein the insertion device is capable of insertion into a body opening;
 - an energy source located at the proximal end of the insertion device; and
 - an energy transmitting device located at the distal end of the insertion device, wherein the energy transmitting device is communicably connected to the energy source through the insertion device, wherein the energy transmitting device directs energy generated by the energy source onto an area of tissue making up the sphincter to heat the tissue to a temperature of between 50°C and 70°C to cause collagen shrinkage.
2. The device of claim 1 wherein the energy source generates energy at a level to heat the tissue to a temperature of between 63°C and 65°C.
3. The device of claim 1, wherein the tissue is heated within the desired range in a time period of between about 1 microsecond and 1 minute.
4. The device of claim 1, wherein the energy source generates electromagnetic energy.

5. The device of claim 1, wherein the insertion device comprises an endoscope.

6. The device of claim 1, and further including means for cooling surface tissue of the sphincter to prevent surface tissue damage while the energy transmitting device radiates energy.

7. The device of claim 6, wherein the means for cooling dissipates heat generated in the sphincter surface tissue to maintain a temperature below 50°C in the surface tissue.

8. The device of claim 1, wherein an inflatable balloon is located with the energy transmitting device at the distal end of the insertion device and is communicably connected through the insertion device to an inflation device located at the proximal end of the insertion device.

9. A lower esophageal sphincter tightening device which inserts an energy transmitting device connected to an energy source in proximity of the lower esophageal sphincter by means of an insertion device, wherein the energy transmitting device radiates energy generated by the energy source onto the lower esophageal sphincter tissue to generate sufficient heat to cause the lower esophageal sphincter tissue to tighten.

10. The device of claim 9, wherein the energy source includes an electromagnetic energy generator.

11. The device of claim 9, wherein the energy source generates energy at a level which heats the lower esophageal sphincter tissue to a

temperature of between 50°C and 70°C and preferably of between 63°C and 65°C.

12. The device of claim 11, wherein the lower esophageal sphincter tissue is heated within the desired temperature range in a time period of between about 1 microsecond to 1 minute.

13. The device of claim 9, wherein the insertion device is an endoscope.

14. The device of claim 9, and further including a means for cooling the lower esophageal sphincter surface tissue to prevent surface tissue damage while the energy transmitting device radiates energy.

15. The device of claim 14, wherein the means for cooling dissipates thermal energy generated in the lower esophageal sphincter surface tissue to maintain a temperature below 50°C in the surface tissue.

16. The device of claim 9, wherein an inflatable balloon is located with the energy transmitting device.

17. A lower esophageal sphincter tightening device; the device comprising;

an insertion device capable of insertion into a body opening;
an energy transmitting device located at a distal end of the
insertion device, wherein the distal end of the insertion
device places the energy transmitting device in the

proximity of a target area comprising the lower esophageal sphincter; and
an energy source located at a proximal end of the insertion device which is communicably connected to the energy transmitting device through the insertion device, wherein the energy source generates and transmits energy to the energy transmitting device for radiation onto the target area at a level sufficient to heat tissue in the target area to a temperature of between 50°C and 70°C in a time period of between about 1 microsecond to 1 minute.

18. The device of claim 17, wherein the energy source includes an electromagnetic energy generator.

19. The device of claim 17, wherein the energy source generates energy at a level for heating tissue in the target area to a temperature of between 63°C and 65°C.

20. The device of claim 17, where a submucosa layer of tissue comprises the target area.

21. The device of claim 17, and further including a means for cooling the target area surface tissue to prevent surface tissue damage while energy is radiated from the energy transmitting device.

22. The device of claim 21, wherein the means for cooling maintains surface tissue adjacent the target area at a temperature below 50°C.
23. The device of claim 17, wherein the insertion device is an endoscope.
24. The device of claim 17, wherein an inflatable balloon is located with the energy transmitting device for positioning and/or controlling collagen shrinkage, the inflatable balloon being connected to an inflation device.
25. A method to tone or tighten a sphincter, the method including;
inserting an energy transmitting device located at a distal end
of an insertion device into a body opening;
positioning the energy transmitting device in proximity of the
sphincter via the insertion device; and
transmitting energy from an energy source through the
insertion device to the energy transmitting device for
radiation onto the sphincter tissue, wherein the level of
energy generated and transmitted by the energy source
heats sphincter tissue to a temperature of between
50°C and 70°C within a time period of between about
1 microsecond to 1 minute to cause collagen shrinkage
and tissue tightening.
26. The method of claim 25 and further including heating the
sphincter tissue to a temperature of between 63°C and 65°C.

27. The method of claim 25 and further including cooling the sphincter surface tissue to prevent surface tissue damage during radiation of energy onto the sphincter.

28. The method of claim 27 and further including maintaining the sphincter surface tissue at a temperature below 50° C.

29. The method of claim 25 and further including inflating a balloon by an inflation device which is communicably connected to the balloon through the insertion device, wherein the balloon is located with the energy transmitting device and positions the energy transmitting device 30.

30. The method of claim 29, wherein the balloon controls the amount of collagen shrinkage.

31. A device for toning or tightening a sphincter within a body, the device comprising:

- a. an insertion device having a proximal end and a distal end, wherein the insertion device is configured for insertion into a body opening and comprising positioning means for positioning an energy transmitting device proximate a target area in a sphincter;
- b. an energy source located at the proximal end of the insertion device; and
- c. an energy transmitting device located at the distal end of the insertion device, wherein the energy transmitting device is communicably connected to the energy source through the insertion device, and wherein the energy transmitting device comprises at least one antenna for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature greater than about 50° C in the targeted tissue area.

32. The device of claim 31, wherein the energy source generates electromagnetic energy.

33. The device of claim 31, wherein the insertion device comprises an endoscope.

34. The device of claim 31, and further including means for cooling surface tissue of the sphincter to prevent surface tissue damage while the energy transmitting device radiates energy.

35. The device of claim 34, wherein the means for cooling dissipates heat generated in the sphincter surface tissue to maintain a temperature below about 50° C in the surface tissue.

36. The device of claim 31, wherein the positioning means comprises an expandable structure.

37. The device of claim 36, wherein the expandable structure comprises an inflatable balloon.

38. The device of claim 37, wherein the inflatable balloon is located with the energy transmitting device proximate the distal end of the insertion device and is communicably connected through the insertion device to an inflation device located at the proximal end of the insertion device.

39. The device of claim 31, wherein the antenna is configured to limit and control the amount of energy directed at a specific location within the targeted tissue.

40. The device of claim 37, wherein an antenna is a directional antenna.

41. The device of claim 31, wherein the energy transmitting device comprises a portion which extends generally radially away from the insertion device.

42. A device for toning or tightening an anal sphincter within a body, the device comprising:

- a. an insertion device having a proximal end and a distal end, wherein the insertion device is configured for insertion into a body opening and comprising

positioning means for positioning an energy transmitting device proximate a target area in an anal sphincter;

b. an energy source located at the proximal end of the insertion device; and

c. an energy transmitting device located at the distal end of the insertion device, wherein the energy transmitting device is communicably connected to the energy source through the insertion device, and wherein the energy transmitting device comprises at least one antenna for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature greater than about 50° C in the targeted tissue area and wherein the antenna is configured to limit and control the amount of energy directed at a specific location within the targeted tissue.

43. The device of claim 42, wherein at least one antenna is an RF antenna.

44. The device of claim 42, wherein at least one antenna is a microwave antenna.

45. The device of claim 43, wherein the directional antenna is an RF antenna.

46. The device of claim 43, wherein the directional antenna is a microwave antenna.

47. The device of claim 42, wherein the energy transmitting device comprises a portion which extends generally radially away from the insertion device.

48. A device for toning or tightening a urinary sphincter within a body, the device comprising:

a. an insertion device having a proximal end and a distal end, wherein the insertion device is configured for insertion into a body opening and comprising positioning means for positioning an energy transmitting device proximate a target area in a urinary sphincter;

b. an energy source located at the proximal end of the insertion device; and

c. an energy transmitting device located at the distal end of the insertion device, wherein the energy transmitting device is communicably connected to the energy source through the insertion device, and wherein the energy transmitting device comprises at least one antenna for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature greater than about 50° C in the targeted tissue area and wherein the positioning means comprises an inflatable balloon and wherein at least one antenna is a directional antenna.

49. A device for toning or tightening a sphincter within a body, the device comprising:

- a. an insertion device having a proximal end and a distal end, wherein the insertion device is configured for insertion into a body opening and comprising structure for positioning an energy transmitting device proximate a target area in a sphincter;
- b. an energy source located at the proximal end of the insertion device;
- c. an energy transmitting device located at the distal end of the insertion device; and
- d. observation and control pieces proximate the proximal end to aid in proper positioning of the distal end; and

wherein the energy transmitting device is communicably connected to the energy source through the insertion device, and wherein the energy transmitting device comprises at least one antenna for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature greater than about 50° C in the targeted tissue area of the sphincter.

50. The device of claim 49, further comprising a fiber optic cable at the distal end of the insertion device communicably connected to an eye piece at the proximal end of the device.

51. The device of claim 49, wherein the structure for positioning comprises an expandable structure adapted to prevent dispersion of heat generated in the targeted tissue by compressing the targeted tissue area.

52. The device of claim 49, wherein said energy transmitting device comprises a structure suitable for causing collagen shrinkage for tightening the sphincter.

53. The device of claim 49, wherein the energy transmitting device comprises a plurality of antenna positioned upon the outer or inner surface of the expandable structure.

54. The device of claim 49, wherein the energy transmitting device comprises at least one antenna for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature of between 63° and 65° C in the targeted tissue area.

55. A device for toning or tightening a sphincter within a body, the device comprising:

- a. an insertion device having a proximal end and a distal end, wherein the insertion device is configured for insertion into an oral body opening and comprising an expandable positioning structure for positioning at least one energy transmitting device proximate a target area in a sphincter;
- b. an energy source located at the proximal end of the insertion device; and
- c. an energy transmitting device located at the distal end of the insertion device, wherein the energy transmitting device is communicably connected to the energy source through the insertion device, and wherein the energy transmitting device is configured for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature greater than about 50° C in the targeted tissue area and further wherein the energy transmitting device is configured to limit and control the amount of energy directed at a specific location within the targeted tissue.

56. The device of claim 55, wherein the energy source generates electromagnetic energy.

57. The device of claim 55, wherein the insertion device comprises an endoscope.

58. The device of claim 55, and further including means for cooling surface tissue of the sphincter to prevent surface tissue damage while the energy transmitting device radiates energy.

59. The device of claim 58, wherein the means for cooling dissipates heat generated in the sphincter surface tissue to maintain a temperature below about 50° C in the surface tissue.

60. The device of claim 55, wherein the expandable structure comprises an inflatable balloon.

61. The device of claim 60, wherein the inflatable balloon is located with the energy transmitting device proximate the distal end of the insertion device and is communicably connected through the insertion device to an inflation device located at the proximal end of the insertion device.

62. The device of claim 25, wherein the energy transmitting device comprises a portion which extends generally radially away from the insertion device.

63. A device for toning or tightening a sphincter within a body, the device comprising:

- a. an insertion device having a proximal end and a distal end, wherein the insertion device is configured for insertion into a body opening and comprising structure for positioning an energy transmitting device proximate a target area in a lower esophageal sphincter;
- b. an energy source located at the proximal end of the insertion device;
- c. an energy transmitting device located at the distal end of the insertion device; and
- d. observation and control pieces proximate the proximal end to aid in proper positioning of the distal end; and

wherein the energy transmitting device is communicably connected to the energy source through the insertion device, and wherein the energy transmitting

device comprises a plurality of antennae positioned upon outer or inner surfaces of the expandable structure for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature greater than about 50° C in the targeted tissue area of the sphincter.

64. The device of claim 63, further comprising a fiber optic cable at the distal end of the insertion device communicably connected to an eye piece at the proximal end of the device.

65. The device of claim 63, wherein the structure for positioning comprises an expandable structure adapted to prevent dispersion of heat generated in the targeted tissue by compressing the targeted tissue area.

66. The device of claim 63, wherein said energy transmitting device comprises a structure suitable for causing collagen shrinkage for tightening the sphincter.

67. The device of claim 63, wherein the energy transmitting device comprises at least one antenna for directing energy generated by the energy source to an area of tissue making up the targeted tissue area of the sphincter to heat the targeted tissue area to a temperature of between 63° and 65° C in the targeted tissue area.

68. The device of claim 63, wherein the energy source generates electromagnetic energy.

69. The device of claim 63, wherein the insertion device comprises an endoscope.

70. The device of claim 63, and further including means for cooling surface tissue of the sphincter to prevent surface tissue damage while the energy transmitting device radiates energy.

71. The device of claim 70, wherein the means for cooling dissipates heat generated in the sphincter surface tissue to maintain a temperature below about 50° C in the surface tissue.

72. The device of claim 63, wherein the expandable structure comprises an inflatable balloon.

73. The device of claim 72, wherein the inflatable balloon is located with the energy transmitting device proximate the distal end of the insertion device and is communicably connected through the insertion device to an inflation device located at the proximal end of the insertion device.

74. The device of claim 63, wherein the energy transmitting device comprises a portion which extends generally radially away from the insertion device.